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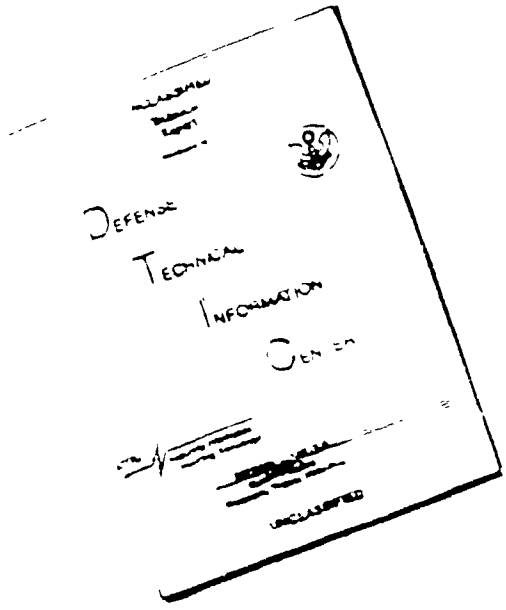

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USAF Contr No W-19-122 -52

Progress Report
No. P-2066-7

THE FRANKLIN INSTITUTE

LABORATORIES FOR RESEARCH AND DEVELOPMENT

Philadelphia 3, Pennsylvania

MECHANICAL AND CIVIL ENGINEERING DIVISION

Progress Report March 1, 1949 to March 31, 1949

On Activities in Connection with Project Blossom IV

Prepared under Contract W-19-122-ac-52

for

The Air Material Command
3160th Electronics Station
Cambridge Field Station
Cambridge, Massachusetts

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Mr. W. F. Gould, Project Engineer

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Copies No.	1 - 24 and Reproducible	Commanding Officer Air Materiel Command 3160th Electronics Station Cambridge Field Station Cambridge 39, Massachusetts Attention: Dr. Marcus O'Day, ERCNL

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BLOSSOM IV PROJECT

1. PURPOSE AND SCOPE

The responsibility and function of The Franklin Institute in connection with the Blossom IV project as given in the contract W-19-122-ac-52 with the Watson Laboratories, Air Materiel Command, Red Bank, New Jersey, dated August 1, 1949 is to furnish engineering services, design, construction, installation of special equipment, and prepare changes in design of Blossom IV equipment as directed by Cambridge Field Station in accordance with requirements of the United States Air Force Upper Air Research Program. Dr. Marcus O'Day of the Air Materiel Command, 3160th Electronics Research Laboratory, Cambridge Field Station, Cambridge, Massachusetts, is the Project Engineer of this project.

2. PROGRESS

2.1 General

Work under this contract terminated as of March 31. Further participation of The Franklin Institute in the Blossom project will be conducted under Contract AF 19(122)-33.

On March 3 all active drawings--with revisions to March 2, 1949--prepared by The Franklin Institute under task number 2086, were sent to the Electronics Research Laboratory. An index was inclosed which listed all the active drawings as well as those which have been voided and those of preliminary status. The shipment included:

1 Index	36 "C" Size
80 "A" Size	32 "D" Size
29 "B" Size	9 "E" Size

These drawings in the 2086 series show the complete design and detail drawings of the instrumentation of the instrument compartment and all special changes in the structure required by the equipment.

2.1.1 Blossom IV-A

During the first three weeks of March, The Franklin Institute field crew installed and wired the Blossom IV-A nose section and assembled the nose section to V-2 rocket #41. Final tests and adjustments were made and the missile was fired on the evening of March 21. According to observers at the firing the Blossom IV-A nose section failed to separate from the missile and the rocket returned to earth in one streamlined unit. Since the rocket was completely demolished no physical evidence could be gathered which would establish the cause of failure to separate. Telemeter records of the operation of the instruments in

the nose section were obtained, hence, it has been established that the control system functioned as intended. However, the cameras assigned to record the telemeter channel for the separation impulse signal to the rocket jammed and could not be adjusted in time to secure a permanent record. A conference has been scheduled for April 7 at The Franklin Institute and representatives of Electronics Research Laboratory, Wright-Patterson Air Force Base, Bell Aircraft and The Franklin Institute will discuss plans for modifying the Bell ejection system and other methods of separating the Blossom IV nose section from the V-2 missile.

2.1.2 Blossom IV-B

A drawing (B-211-2086) showing the weight distribution and center of gravity of the Blossom IV-B nose section and of the loaded V-2 missile was prepared and copies were sent to the Cook Research Laboratories and to the Electronics Research Laboratory. The nose section shown includes an aluminum nose cone, instrument compartment skins and rack, parachute compartment, control compartment, fairing, and a payload of 1,531 pounds. The center of gravity of the Blossom IV-B nose section is 60.275-in. forward of Station 30 and 498.875-in. forward of the venturi.

On March 17 a drawing (B-213-2086), showing the center of gravity and weight distribution of the standard German V-2 rocket, with fuel, was completed. The total weight, with fuel is 27,928-lb.; without fuel 8,776-lb. The center of gravity, with fuel, is 248.14-in. forward of the venturi. This drawing will be used for reference purposes.

2.2 Blossom IV-A Nose Section

2.2.1 Instrument Compartment

Assembly drawing D-205-2086, showing the design of the photocell dummy door, was completed on March 1. Drawing A-208-2086, showing the hinge rod for the dummy door, was also completed on the same date.

A plug guard was added to the "short" type of battery box on Shelf A of the instrument compartment and a drawing (A-210-2086) of the plug was made during March.

The Franklin Institute secured and shipped to the Holloman Air Force Base six (6) half-wave rectifier tubes #4-B-32 for use in the Luxembourg equipment.

A supply of 16mm Linograph Panchromatic film was sent by air to the Franklin Institute personnel at Holloman Air Force Base for loading in the cameras intended to take pictures of the Luxembourg experiment.

2.2.2 Control Compartment

The Blossom IV-A control compartment was modified in the field at the White Sands Proving Ground to provide 1/2-in. of wood insulation completely around the Doppler doors. This modification provided marginal signals throughout the flight of V-2 missile #41 on March 21.

2.3 Blossom IV-B Nose Section

2.3.1 Nose Cone

The Franklin Institute was requested to design and submit drawings of a suggested assembly for the Pitot tube and the nose cone top ring (Station 3) for Blossom IV-B nose section. In accordance with this request, drawing C-354-1906.4 was prepared and copies were sent to the Cook Research Laboratories and to the Electronic Research Laboratory on March 8.

2.3.2 Instrument Compartment

In response to a request from the Cook Research Laboratories for information regarding the installation of prism blisters for K-25 cameras, The Franklin Institute sent that station copies of drawings C-81-1906.5, B-82-1906.5, and B-83-1906.5. These drawings had been prepared for the Aspect containers in former Blossom project missiles.

2.3.3 Parachute Compartment

Cook Research Laboratories are to supply the Franklin Institute with plugs and cables for 10 leads through the parachute compartment from the parachutes. The plugs and cables are to be installed in the parachute compartment by the Franklin Institute.

The Franklin Institute is also being sent cabling and pull-away plugs for leads that will run from Sector F of the Instrument Compartment, between the inner and outer skins of the parachute compartment, and terminate in pull-away plugs in the aft rim of the parachute compartment. At least two of these pull-away plugs will be used. The plugs in the control compartment will be localized in Quadrant I.

2.3.4 Control Compartment

During the month, The Franklin Institute investigated the possibility of using two compositions, melamine and silicone base fibreglass, for constructing the Doppler door insulation in Blossom IV-B. Permission to construct two sample sections, one of melamine and one of silicone base fibreglass, was received from the Electronic

Research Laboratory and these sections were made in accordance with Franklin Institute drawing C-212-2086. These sections were tested at the Ballistics Research Laboratory on March 25 and proved satisfactory. The difficulty of forming the fibreglass laminations was discussed with officials of the Ballistics Research Laboratory and it was agreed to build the laminations over the compound curvature of the door using strips of the material and lapping the end joints. This work will be carried on under contract AF 19(122)-33 .

2.3.5 Fairing

The middle body skins for Blossom IV-B, containing the fairing section, were shipped to the Holloman Air Force Base on March 1.

2.4 Subsequent Blossom IV Equipment

2.4.1 Nose Cone

The fourth and final aluminum nose cone required under this contract was delivered to The Franklin Institute on March 1. This nose cone will be shipped to the Electronics Research Laboratory when needed.

A Luxembourg tank and mounting plate, for a future Blossom IV project missile carrying the Luxembourg experiment, was completed on March 27. The tank was fabricated in accordance with drawing C-87-2086.7, Rev. 1. The mounting plate has been made on the design shown in drawing C-86-2086.7, Rev. 2

W. F. Gould

W. F. GOULD
Project Engineer

MONTHLY FINANCIAL SUMMARY

BLOSSOM CONTRACT - W-19-122-ac-52*

Total Blossom Contract	$70,160.00	Expended to March 31, 1949	$68,800.20
		Balance - March 31, 1949	1,359.80

Man Hours Expended March 1, 1949 to March 31, 1949

10,433½ Hours

Total Blossom IV Expenditures to March 31, 1949

	Salary and Labor	Materials	Overhead	Total
Blossom IV	$29,946.06	$22,712.44	$16,141.70	$68,800.20

*Figures for this summary were obtained from Statement of Contract Costs as of March 31, 1949.

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